Initial Statement of Reasons
Primary Maximum Contaminant Level Revisions
Title 22, California Code of Regulations

All suppliers of domestic water to the public are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act (42 U.S.C. 300f et seq.) as well as by the California Department of Health Services (Department) under the California Safe Drinking Act (Sections 4040.1 and 116300-116750, Health and Safety Code [H&S Code]). California has been granted "primacy" for the enforcement of the Federal Act. In order to receive and maintain primacy, states must promulgate regulations that are no less stringent than the federal regulations.

In accordance with federal regulations, California requires public water systems to sample their sources and have the samples analyzed for inorganic and organic substances in order to determine compliance with drinking water standards, also known as maximum contaminant levels (MCLs). Primary MCLs are based on health protection, technical feasibility, and costs. The water supplier must notify the Department and the public when a primary MCL has been violated and take appropriate action.

Pursuant to section 116365(g) of the H&S Code, the Department is mandated to periodically review primary MCLs. Since a major criteria for determining whether a revision should be made relates to current knowledge about contaminant risk, the Department has proceeded to review the existing MCLs within the context of public health goals (updated risk assessments) as they have been completed. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has now completed public health goals (PHGs) for a number of the existing MCL contaminants (see the OEHHA website: http://www.oehha.ca.gov/water/phg/index.htm). The OEHHA PHG documents most pertinent to this proposed regulation are those for cyanide, ethylbenzene, oxamyl, atrazine, methoxychlor, and 1,2,4-trichlorobenzene; all are dated December 1997. The Department conducted an initial screening to determine whether any of these MCLs merited a more comprehensive review, using the following criteria:

- The relationship between the PHG and both the federal and state MCLs;
- Any changes in treatment techniques for chemical removal that would provide for a materially greater protection of public health; and
- Any new scientific evidence indicating that the substance might present a materially different risk to public health than was previously determined.

In two separate lists in 1998 and 1999, the Department designated a number of chemicals selected for a more comprehensive review by this initial screening: Cyanide, ethylbenzene, oxamyl, atrazine, methoxychlor, and 1,2,4-trichlorobenzene were among those selected because the PHGs were below the MCLs and the PHGs reflected changes in perceived risk to public health.

The Department used the "Procedure for Reviewing Maximum Contaminant Levels (MCLS) for Possible Revision" that was finalized in August 1999 (see attached) for its MCL reviews.

To assess chemical occurrence in drinking water sources for the MCL reviews, the most recent four years of analytical data were obtained from the Department's Water Quality Monitoring (WQM) database and analyzed for each chemical under review. The Department has established individual standardized reporting (quantification) levels called "detection levels for purposes of reporting" (DLRs) for the chemicals in WQM. The DLR represents the level at which the Department is confident about the accuracy of the quantity of contaminant being reported. The DLRs have been adopted into the regulations for chemicals with primary MCLs.

Review of the occurrence data for each of the chemicals listed above indicated that there were no detects above the PHGs, except one that was never confirmed. Several of the chemicals had no detects above the DLRs either (atrazine, methoxychlor and oxamyl). Thus, revising these MCLs would not result in any fiscal impact on water systems, but would provide greater health protection should detections occur in the future. Any future detections above MCL levels could be addressed by available and effective treatment technologies that are reasonable in cost. Therefore, the Department proposes to amend chapter 15, division 4, title 22 of the California Code of Regulations as follows:

- Table 64431-A would be amended to reduce the MCL for cyanide from 0.2 to 0.15 mg/L.
- Table 64444-A would be amended to reduce the MCLs for ethylbenzene and 1,2,4-trichlorobenzene from 0.7 and 0.07 mg/L to 0.3 and 0.005 mg/L, respectively, to provide greater health protection.
- Table 64444-B would be amended to reduce the MCLs for atrazine, methoxychlor, and oxamyl from 0.003, 0.04 and 0.2 mg/L to 0.001, 0.03, and 0.05 mg/L, respectively, to provide greater health protection.
- Table 64445.1-A would be amended to reduce the detection limit for reporting purposes (DLR) for atrazine from 0.001 mg/L to 0.0005 mg/L to provide for
- Sections 64468.1, 64468.2 and 64468.3, article 19, which contain the language used to notify the public when there are MCL violations, would be amended to update the MCL levels for each of the chemicals for which the MCL would be reduced.

The net effect would be that community and nontransient-noncommunity water systems would be required to comply with more stringent MCLs for cyanide, ethylbenzene, 1,2,4-trichlorobenzene, atrazine, methoxychlor, and oxamyl.

None of the proposed amendments would affect California's primacy status, because the net affect of these amendments is that the state's regulation would be more stringent than the federal, which is allowed.

In addition to the above amendments, the Health and Safety Code citations in the authority/reference NOTES for sections 64468.1, 64468.2, and 64468.3 would be amended for consistency with the relevant sections of the Health and Safety code as currently codified.

The following paragraphs describe and explain the proposed amendments.

Article 4. Primary Standards - Inorganic Chemicals

Section 64431. Maximum Contaminant Levels - Inorganic Chemicals

The purpose of this section is to list the inorganic chemicals for which primary maximum contaminant levels (MCLs) have been established to protect the health of consumers of drinking water served by community and nontransient-noncommunity water systems. The Department proposes to reduce the MCL for cyanide from the existing 0.2 mg/L to 0.15 mg/L.

Cyanide is an inorganic chemical that can enter drinking water sources from discharges from steel/metal, plastic or fertilizer factories.

In 1991, EPA adopted an MCL of 0.2 mg/L for cyanide. After OEHHA reviewed and concurred with the federal MCL, the Department adopted this MCL in 1994. In 1997, OEHHA completed a full risk assessment and adopted a PHG of 150 µg/L (0.150 mg/L) for cyanide, which is above the current DLR of 0.1 mg/L. The PHG is based on an absence of clinical and histopathological effects in laboratory animals. Effects are related to the inhibition of cellular respiration resulting in cellular hypoxia, to which the central nervous system and heart are particularly susceptible.

WQM data on detections in drinking water sources indicate only one source with a detection greater than the PHG; follow up on that result did not confirm the finding. Therefore, it appears that there would be no cost impact if the MCL were lowered to 0.15 mg/L, and there would be increased public health protection provided should there be any subsequent detects.

Article 5.5. Primary Standards -- Organic Chemicals

Section 64444. General Requirements

The purpose of this section is to list the organic chemicals for which primary maximum contaminant levels (MCLs) have been established to protect the health of consumers of drinking water served by community and nontransient-noncommunity water systems.

The Department proposes to reduce the following MCLs: ethylbenzene from 0.7 to 0.3 mg/L; 1,2,4-trichlorobenzene from 0.07 to 0.005 mg/L; atrazine from 0.003 mg/L to 0.001 mg/L; methoxychlor from 0.04 to 0.03 mg/L; and oxamyl from 0.2 to 0.05 mg/L. Details are provided below.

Ethylbenzene Ethylbenzene is a widely used industrial solvent that can enter drinking water sources through discharges from petroleum refineries or industrial chemical factories. The Department proposes to reduce the MCL from the existing 0.7 mg/L to 0.3 mg/L.

Ethylbenzene causes liver toxicity in laboratory animals. In 1989, the Department adopted an MCL of 0.68 mg/L for ethylbenzene, based on OEHHA's risk assessment. EPA adopted an MCL of 0.7 mg/L in 1991 that the Department subsequently adopted for

conformance in 1994, since there was no significant difference in public health protection. In 1997, OEHHA updated its risk assessment and adopted a PHG of 300 µg/L (0.300 mg/L). The PHG contains an additional 10-fold uncertainty factor to take into account possible carcinogenicity.

WQM occurrence data for the last 4 years indicate 26 sampling sites with detections, with a maximum finding of 28 µg/L (0.028 mg/L). Given that none of the detections exceeds the PHG, there would be no cost impact from lowering the MCL to 0.3 mg/L and public health protection would be increased, should there be higher levels of ethylbenzene detections in the future.

1,2,4-Trichlorobenzene 1,2,4-Trichlorobenzene is an organic chemical that can enter drinking water sources from a variety of industrial activities. The Department proposes to reduce the MCL from the existing 0.7 mg/L to 0.005 mg/L.

1,2,4-Trichlorobenzene causes adrenal gland enlargement in laboratory animals. EPA adopted an MCL of 0.07 mg/L for 1,2,4-trichlorobenzene in 1992. After OEHHA reviewed and concurred with the federal standard, the Department adopted an MCL at the same level in 1994. In 1998, OEHHA completed a full assessment and adopted a PHG of 5 µg/L (0.005 mg/L). An additional 10-fold uncertainty factor was used in determining the PHG, to take into account the potential for carcinogenicity. The DLR is 0.0005 mg/L.

WQM occurrence data indicate that there were no 1,2,4-trichlorobenzene detections above the PHG and only four sampling sites with detections below the PHG. Consequently, a reduction in the MCL would have no apparent cost impact, but would increase public health protection for any subsequent detections.

Atrazine Atrazine is an organic chemical registered for use as a herbicide in California for nonselective weed control along highways and railroad rights-of-way, as well as selective season-long weed control in sorghum, corn and other crops. Other formulations are used as pre-emergent and early post-emergent herbicides for citrus groves, sorghum, and corn. The Department proposes to reduce the MCL from the existing level of 0.003 mg/L to 0.001 mg/L.

Atrazine causes cancer in laboratory animals and is considered to pose a cancer risk to people. The Department adopted an MCL of 0.003 mg/L in 1989, based on the risk assessment conducted by OEHHA (then the Department of Health Services) at that time. In 1991, the U.S. Environmental Protection Agency (EPA) adopted an MCL at the same level. In 1998, OEHHA updated its risk assessment and adopted a PHG of 0.15 µg/L (0.00015 mg/L). This PHG is below the current DLR of 0.001 mg/L.

According to WQM, there have been no reported detections of atrazine in any drinking water sources for the past four years. Whether a lower reporting level would have resulted in some reported detections cannot be known, but given the lack of detections, there would be no apparent cost impact from lowering the MCL to a level equivalent to

the DLR of 0.001 mg/L. Doing so would provide greater protection to the public should there be any detections in the future. However, an MCL set at the DLR presents problems in that there is no warning of an impending MCL violation, any "official" detect is at the MCL, and compliance determinations (averaging of the initial and followup monitoring samples pursuant to the regulations) are awkward. Therefore, the feasibility of lowering the MCL for atrazine is contingent on the feasibility of lowering the DLR. The Department's Sanitation and Radiation Laboratory Branch conducted analytical work and consulted with an advisory group of commercial laboratories and determined that the atrazine DLR could be lowered to 0.0005 mg/L, without losing any confidence in the accuracy of reported results. A DLR of 0.0005 mg/L with an MCL of 0.001 mg/L would provide an adequate confidence range in reporting results, warning of the chemical's presence before its MCL is exceeded, and reasonable MCL compliance determinations.

Methoxychlor Methoxychlor is an insecticide used on fruits and alfalfa that can enter drinking water sources through runoff or leaching. The Department proposes to reduce the MCL from the existing level of 0.04 mg/L to 0.03 mg/L.

Health effects associated with methoxychlor are reproductive difficulties. In 1991 EPA adopted an MCL of 0.04 mg/L for methoxychlor. In 1994, after OEHHA reviewed and concurred with the federal level, the Department revised its existing MCL of 0.1 mg/L adopted in 1977 to 0.04 mg/L. In 1998, OHHEA completed a full risk assessment and adopted a PHG of 30 µg/L (0.030 mg/L).

WQM occurrence data for the last four years indicate no detections greater than the DLR of 0.01 mg/L. Given the absence of detections, there would be no cost impact from lowering the MCL to the PHG of 0.03 mg/L, and there would be increased public health detection should a detect occur.

Oxamyl Oxamyl can enter drinking water sources through runoff and leaching of insecticides used on field crops, fruits, ornamentals and especially on apples, potatoes, and tomatoes. The Department proposes to reduce the MCL from the existing level of 0.2 mg/L to 0.05 mg/L.

EPA adopted an MCL of 0.2 mg/L for oxamyl in 1992. After OEHHA reviewed and concurred with the federal risk assessment, the Department adopted an MCL at the same level in 1994. In 1997, OEHHA completed a full risk assessment and adopted a PHG of 50 µg/L (0.05 mg/L) which is based on decreased body weight gain in chronically-exposed laboratory animals.

WQM occurrence data for the last four years indicate no detections greater than the DLR of 0.02 mg/L. Given the absence of detects, there would be no cost impact from lowering the MCL to 0.05 mg/L, but there would be increased public health protection should a detection occur.

Section 64445.1 Repeat Sampling

The purpose of this section is to define the levels of detection for reporting purposes (DLRs) for all chemicals with MCLs and to establish the monitoring and MCL compliance requirements.

Table 64445.1-A would be amended to revise the DLR for atrazine. The PHG of 0.15 ug/L (0.00015 mg/L) for atrazine is below the existing DLR of 0.001 mg/L. The Department is proposing to reduce the MCL for atrazine to 0.001 mg/L, but in order to provide for reasonable compliance monitoring, the DLR needs to be below the MCL. As mentioned above, the Department determined that the atrazine DLR could be lowered to 0.0005 mg/L, without losing any confidence in the accuracy of reported results. Therefore, the Department proposes to amend the atrazine DLR accordingly.

Article 19. Notification of the Department and Water Consumers

Section 64468.1. Health Effects Language - Inorganic Chemicals

The purpose of this section is to provide language to be used in communicating with the public when an MCL for an inorganic chemical has been violated; the language is intended to inform the public about the possible health effects associated with the chemical. The proposed regulation would amend this section by revising the MCL level in subsection (h) for consistency with the proposed MCL.

Section 64468.2. Health Effects Language – Volatile Organic Chemicals

The purpose of this section is to provide language to be used in communicating with the public when an MCL for a volatile organic chemical has been violated; the language is intended to inform the public about the possible health effects associated with the chemical. The proposed regulation would amend this section by revising the MCL levels in subsections (k) and (p) for consistency with the proposed MCLs.

Section 64468.3. Health Effects Language – Synthetic Organic Chemicals

The purpose of this section is to provide language to be used in communicating with the public when an MCL for a synthetic organic chemical has been violated; the language is intended to inform the public about the possible health effects associated with the chemical. The proposed regulation would amend this section by revising the MCL levels in subsections (b), (v), and (w) for consistency with the proposed MCLs.

Procedure for Reviewing Maximum Contaminant Levels (MCLs) for Possible Revision

August 1, 1999

Objectives: Pursuant to Health and Safety Code Section 116365(g), DHS is to conduct a comprehensive review of all factors related to a possible revis ion of an MCL, including changes in technology or treatment techniques that permit a materially greater protection of public health or attainment of the public health goal (PHG), and any new scientific evidence that indicates that the substance may present a materially different risk to public health than was previously determined.

Criteria for selection of MCLs for comprehensive review:
Subsequent to the establishment of a PHG, the following criteria will be used to determine whether or not to select the MCL for comprehensive review.

1. Is the PHG lower than the state MCL?
2. Have there been any changes in the risk assessment since the existing MCL was promulgated, pursuant to criteria above?
3. Have there been any changes in technology making contaminant removal more feasible and/or less expensive, pursuant to criteria above?
4. If contaminant is a carcinogen, was existing MCL set at a level associated with greater than a *de minimis* (one excess case of cancer in a million people exposed for a 70-year lifetime) risk?
5. Are there any significant trends in contamination levels indicated by recent occurrence data?

Procedure for comprehensive review:
The comprehensive review includes a cost benefit analysis that, to the extent possible, reflects the incremental costs and benefits that would be accrued if the MCL were to be revised to a more stringent level between the existing MCL and down to and including the PHG. The review also includes an evaluation of the feasibility of quantification at any levels that fall below the current reporting level. The steps are as follows:

1. Obtain drinking water source and system data to use in developing benefits and costs:
   a. All available detection data on occurrence in drinking water in California for past 4 years from WQM (Division of Drinking Water and Environmental Management [DDWEM] compliance monitoring database) and local primacy agencies (LPAs); data should be chronological by drinking water source, within system, within county, whenever possible.
   b. For each drinking water source---type, volume of water supplied, and the population served for each of the last four years (if available); if not available, then for each system--- type and number of sources, proportion of water supplied by groundwater vs surface water, total volume of water supplied for each of past four years, and population served. (If volume of water supplied is not available, estimate using population and 150 gallons/day/person.)
2. Establish a number of possible MCL levels (review points) ranging from the PHG up to the MCL, for purposes of developing an adequate cost-benefit curve.
3. Evaluate the feasibility of quantification at any review points that fall below the current reporting level (DLR).
   a. Discuss available methods and method detection levels with Sanitation and Radiation Laboratory (SRL); contact members of Reporting Levels Workgroup (RLW) for input on feasibility of quantification at levels below DLR.
   b. Eliminate from further consideration any review points that SRL and RLW agree are definitely not quantifiable within $\pm$ 20%; do not eliminate those that are borderline.
4. Develop a matrix of the contaminated drinking water sources, including highest contamination data point, the number of people served, and the estimated water flow in gallons per minute; order from lowest to highest contamination data point for easy division into ranges. A range consists of any level above the lower review point up through the next highest point; e.g., if the review points were 1, 2, and 3, then the ranges would be 1.1 up through 2.5, and 2.6 up through 3.4. (in conformance with

Department policy on significant figures which requires rounding to the nearest significant figure and that the number 5 be rounded to the nearest even number).

5. Benefit determination, i.e., theoretical adverse health effects avoided. Note that this determination assumes that adverse health effects occur immediately on exceeding an MCL; this would never actually be the case, because the MCLs are always set with a significant margin of safety to ensure against that; but for purposes of this type of analysis, the MCL is used as the cutoff for immediate risk of adverse effect.
   a. For carcinogens, determine the number of excess theoretical cancer cases avoided as a function of theoretical cancer risk, contaminant concentration, and population exposed at concentrations just above the review point up through the current MCL.
   b. For noncarcinogens, determine the number of people exposed to the contaminant at concentrations just above the review point up through the current MCL; this number is an estimate of the number of people that would no longer be exposed to the risk of the adverse health affect.
6. Cost determination for removal treatment and additional monitoring incurred
   a. Determine BAT to use in review
      1) Determine whether any new technologies for removal are available that could qualify as Best Available Technology (BAT) for review points (pursuant to Section 116370, H&S Code, requires proof of effectiveness under full-scale field applications for removing the contaminant to below the MCL, i.e., the review points in this case).
      2) Determine technical feasibility of using existing BAT to remove the contaminant to the level of each of the review points.
      3) Determine most cost effective treatment for use in estimating treatment costs (existing BAT or newly qualified BAT; a combination might also be most cost effective, e.g., one more cost effective in the lower concentration range, the other in a higher range).
      4) Develop/obtain cost curves to use in treatment cost estimate

   b. Calculate incremental treatment costs
      1) For each source with contamination above a review point but not above the existing MCL, calculate treatment costs based on estimated source flow and contamination.
      2) For each review point, sum the number of sources being treated and the treatment costs to determine total incremental costs for each point; also sum incremental costs for each system and the number of systems needing treatment.
   c. Calculate incremental monitoring costs
      1) If a determination was made that quantification is feasible below the current DLR to accommodate a review point below that level, to the extent possible, estimate the number of sources that would be required to do followup quarterly monitoring if the reporting level were lowered, and determine the cost per source/year, as well as the number of systems involved and the costs per system/year. Sum costs for all sources/systems that would be impacted for each review point.
      2) For a source with contamination above a review point but not above the existing MCL, calculate the cost of an MCL compliance determination (confirmation sample(s) + 5 additional samples within 6 months). Determine the number of sources/systems that would be required to do compliance determinations for each review point and sum the costs.

Evaluation of comprehensive review

Plot benefits versus costs for each review point. Consider the ratio of benefits to costs at each of the review points.

BUSINESS IMPACT

Pursuant to section 116365(g) of the H&S Code, the Department is mandated to periodically review primary MCLs. Since a major criteria for determining whether a revision should be made relates to current knowledge about contaminant risk, the Department has proceeded to review the existing MCLs within the context of public health goals (updated risk assessments) as they have been completed. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has now completed public health goals (PHGs) for a number of the existing MCL contaminants. The Department conducted an initial screening to determine whether any of these MCLs merited a more comprehensive review.

After conducting the initial screening and subsequent comprehensive review of a number of MCLs, the Department is proposing to amend six: Cyanide, ethylbenzene, oxamyl, atrazine, methoxychlor, and 1,2,4-trichlorobenzene.

- In summary, community and nontransient-noncommunity water systems would be required to comply with more stringent MCLs for cyanide, ethylbenzene, 1,2,4-trichlorobenzene, atrazine, methoxychlor, and oxamyl.

The Department has determined that the proposed regulations would not have a significant adverse impact on businesses, including the ability of California businesses to compete with businesses in other states. The Department's review of the occurrence data in the Water Quality Monitoring database for each of the chemicals listed above indicated that there were no detects above the PHGs, except one that was never confirmed. Several of the chemicals had no detects above the detection levels for purposes of reporting (DLRs) either (atrazine, methoxychlor and oxamyl). Hence, there is no incremental fiscal impact associated with this regulation.

The Department has determined that the regulations will not significantly affect the following:

1. The creation or elimination of jobs within the State of California. The requirements summarized above should not have any affect in this area in that there would not be any change in water system or regulatory personnel needed for compliance with the new requirements.

2. The creation of new businesses or the elimination of existing businesses within the State of California. The nature of the water industry is such that the proposed regulation will not result in the creation or elimination of water systems. The impact of these regulations would be insignificant.

3. The expansion of businesses currently doing business within the State of California. Since water system size is basically a function of the number of service connections (consumers) served, the proposed regulations should not have any affect on expansion.

The Department has determined that the proposed regulations will not affect small business, since Government Code Chapter 3.5, Article 2, Section 11342.610 excludes drinking water utilities from the definition of small business.

ALTERNATIVES CONSIDERED

The Department has determined that no alternative considered by the Department would be more effective in carrying out the purpose for which the amendments to the regulations have been proposed or would be as effective and less burdensome to affected private persons than the proposed amendments.

LOCAL MANDATE DETERMINATION

The proposed regulation will not impose a mandate on local agencies that requires state reimbursement. Local agencies should not incur costs as a result of this regulation. However, if they were to incur costs, those costs would be of the following nature:

First, some local agencies would incur costs in their operation of public water systems. These costs would not be the result of a "new program or higher level of service" within the meaning of Article XIIIB, Section 6 of the California Constitution because they apply generally to all individuals and entities that operate public water systems in California and do not impose unique requirements on local governments. Therefore, no state reimbursement of these costs would be required.

Second, some local agencies could incur additional costs in discharging their responsibility to enforce the proposed regulations for the small public water systems (under 200 service connections) that they regulate. However, the Department has determined that any increase in the local agency costs resulting from enforcing this regulation would be insignificant. Furthermore, local agencies are authorized to assess fees to pay reasonable expenses incurred in enforcing statutes and regulations related to small public water systems. (Health and Safety Code Section 101325) Therefore, no reimbursement of any incidental costs to local agencies in enforcing this regulation would be required. (Government Code Section 17556(d)).